

Contemporary Analysis of Revision and Resection Rates in Radial Head Arthroplasty Used in Elbow Trauma

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Purpose: Radial head arthroplasty (RHA) is a widely accepted treatment of complex radial head fractures and associated injuries. Despite extensive use, combined rates of radial head prosthetic removal/revision have been reported to be near 22.7%. This study aimed to report rates based on the use of modern implants and techniques.

Methods: A retrospective analysis was conducted on patients undergoing radial head replacement for isolated, comminuted radial head fractures or those in association with a terrible triad injury or Monteggia fracture variant with press-fit modular impacts between 2012 and 2024. Inclusion criteria included 6 months or more of follow up. Demographic variables and surgical outcomes (fracture-related infection (FRI), nerve injury, periprosthetic fracture, removal of hardware (ROH)/revision surgery) were collected and analyzed. Elbow range of motion (ROM) and patient-reported measures were documented at last follow up.

Results: In total, 281 patients with 281 RHAs were analyzed. The cohort demonstrated an overall ROH/revision surgery rate of 6.70% (mean follow up: 11.9 ± 13.8 months). Postoperative nerve injuries were documented in 21 patients (7.4%), comprising 12 ulnar nerve neuropathies, five posterior interosseous nerve neuropathies, and four radial nerve neuropathies. Additional complications included FRI in 2.69% ($n = 8$) and periprosthetic fracture in 0.53% ($n = 2$). Table 1 shows patient-reported measures and ROM data.

Conclusion: This study, representing the largest individual analysis of RHA to date, indicates a relatively low rate of ROH/revision surgery at 6 months or more postoperatively.

Table 1: Demographics and Clinical Outcomes

Variable	(Mean $\pm$ Std)
Demographics	
N	281
Age (Years)	52.66 ± 17.74
BMI	28.53 ± 6.40
% Female	60.54%
Length of Follow-Up (Months)	11.94 ± 13.88
Clinical Outcomes	
Rate of Infection	2.69%
Rate of Nerve Injury	7.41%
Rate of Periprosthetic Fracture	0.53%
Rate of Patient Reported Stiffness at 6 Months	30.53%
Rate of Patient Reported Pain at 6 Months	35.88%
Rate of Radial Head Prosthesis Removal or Revision	6.70%
Mean # of Reoperations	0.18 ± 0.50
Elbow Flexion (degrees)	126.82 ± 18.05
Elbow Extension (degrees)	14.22 ± 17.18
Supination (degrees)	75.93 ± 20.97
Protonation (degrees)	82.22 ± 21.58